PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-337911

(43)Date of publication of application : 08.12.2000

(51)Int.Cl. G01C 21/00
G06F 13/00
G06F 17/30
G08G 1/0969
G09B 29/00
G09B 29/10

(21)Application number : 11-151858

(22)Date of filing : 31.05.1999

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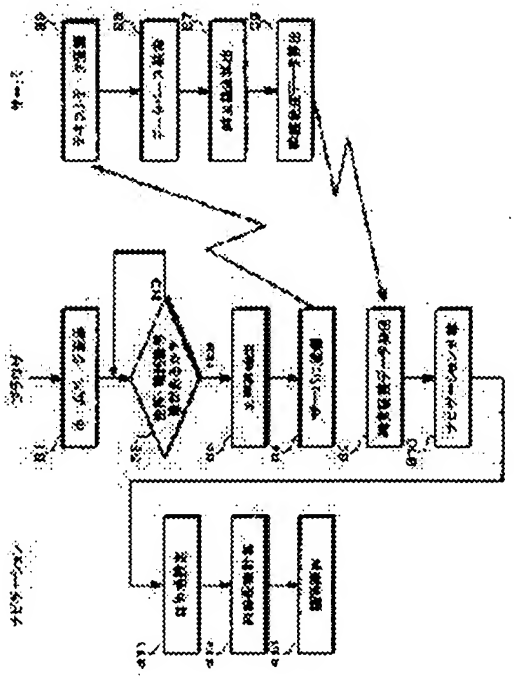
(54) NAVIGATION EQUIPMENT AND NAVIGATION METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To enable route guidance and position display on a map by setting a location introduced on a web page as a destination, in a car navigation system.

SOLUTION: Web pages of internet are inspected by a browser. Character information for specifying a location such as an address and a telephone number is extracted out of information sent from the web pages of internet by an extracting part (S3). The extracted character information is delivered to a server which retrieves position information from the address and the telephone number (S4). The server retrieves position information from the address and the telephone number and delivers the position information to a terminal. When the retrieved position information is returned, this information is delivered to a navigation control part from the browser, and set as a destination (S11). As a result, locations introduced on the web pages as a sight-seeing location, restaurant information, hotel information, etc., can be displayed on a map and guidance of a route to the location is enabled.



LEGAL STATUS

[Date of request for examination] 14.03.2006

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the thing which positions the present location of a mobile, it displays on a map, or a communication device is especially formed about navigation equipment and an approach which search for the path to the destination and carry out path guidance, accesses the Internet, and enabled it to display the web page of WWW (World Wide Web).
[0002]
[Description of the Prior Art] The car-navigation system has spread. A car-navigation system is a system to which the map information recorded on record media, such as CD (Compact Disc), is displayed on a display, and the present location of a mobile is displayed on a map, or it shows the path to the destination while positioning the present location of a mobile with GPS (Global Positioning System) or a gyroscope.
[0003] Moreover, such a car-navigation system is widely used as an available information terminal within the mobile only as the its present location display of a mobile, or path guidance to the destination.
[0004] For example, if guidance not only to map information but a tourist resort, restaurant information, hotel information, etc. are recorded on CD and a car-navigation system is equipped with such a disk, what guidance to a tourist resort, restaurant information, hotel information, etc. were displayed as is known. Furthermore, it equips with CD with which the application of a game or fortune-telling was recorded on the car-navigation system, and the thing which enabled it to enjoy a game and fortune-telling by the automatic in the car one is known.
[0005] Furthermore, enabling it to see the web page of WWW (World Wide Web) of the Internet is proposed using this car-navigation system.
[0006] On current and the web page of the Internet, many information on tourist facilities, such as a famous place of each land, a restaurant, a hotel, etc. is offered. If the web page of the Internet can be accessed using a car-navigation system, can be such information and it can be used for an automatic in the car one.
[0007] For example, when you go out for a drive at a tourist resort, the information on the tourist facilities of the land, a restaurant, a hotel, etc. is needed. When the web page could be seen with the car-navigation system and you go out for a drive in this way at a tourist resort, a web page can be accessed and the information on the tourist facilities of the land, a restaurant, a hotel, etc. can be acquired from a web page.
[0008]
[Problem(s) to be Solved by the Invention] Thus, if connectable [with a car-navigation system] with the Internet, it is a drive place, and the information on web pages, such as guidance to a tourist resort, and restaurant information, hotel information, can be used, and it is very convenient.
[0009] However, in the former, positional information cannot be taken out from the information acquired by the Internet, and it cannot hand over as destination information on car navigation. For this reason, path guidance etc. cannot be carried out by making into the destination locations, such as a tourist resort searched with the Internet, and restaurant information, hotel information.
[0010] That is, if tourist facilities, a restaurant, a hotel, etc. are introduced by the web page, to set up the location of these tourist facilities currently introduced, a restaurant, a hotel, etc., etc. as a destination of a car-navigation system, and to be able to be made to carry out path guidance to existing places, such as those tourist facilities, and a restaurant, a hotel, is desired.
[0011] However, the positional information set as a car-navigation system is the positional information of the LAT and LONG. On the other hand, as a key of some locations, such as a tourist resort currently introduced on the web page, and restaurant information, hotel information, it is only the telephone number, the address, and an easy map, and the information which shows the LAT and LONG is not included. Therefore, it cannot be set as

the destination of a car-navigation system from the information on this web page.
[0012] The tag in which the LAT and LONG information are shown is prepared, and it is possible to embed into the HTML (HyperText Mark-up Language) document which constitutes a web page so that the positional information of a web page can be handed over to a car-navigation system. If such a tag is prepared, it is possible to hand over and carry out path guidance by making the LAT on a web page and LONG information into the destination at a car-navigation system side.
[0013] It must stop however, having to define the new tag in which the LAT and LONG information are shown in this case. Moreover, it becomes impossible to correspond to the web page where the information on such a tag is not embedded, and versatility is lost.
[0014] Therefore, the purpose of this invention is to offer the navigation equipment and the navigation approach which set up as a destination the location currently introduced by the web page, and could be made to perform path guidance and position representation on a map, without defining a special tag.
[0015] The connecting means to which this invention makes connection with a computer network network, The perusal means for perusing the information sent through a computer network network, An extract means to extract the text for pinpointing a location out of the information sent through a computer network network, A positional information retrieval means to search the positional information corresponding to text from the text for pinpointing the location extracted with the extract means, The positioning means for positioning the present location of a mobile, and the positional information of the destination, Based on the positional information searched for with the positioning means, it has the navigation control means which controls navigation. The text for pinpointing a location is extracted out of the information sent through a computer network network by the extract means. The positional information corresponding to the text which searched the positional information corresponding to the text extracted by the positional information retrieval means, set it as the navigation control means by having made searched positional information into the destination, and was searched, It is navigation equipment characterized by controlling navigation based on the positional information positioned with the positioning means.
[0016] This invention makes connection with a computer network network, and the information sent through a computer network network is perused. The text for pinpointing a location is extracted out of the information sent through a computer network network. It is the navigation approach characterized by searching the positional information corresponding to text and controlling navigation based on the positional information corresponding to the searched text, and the positioned positional information from the text for pinpointing the extracted location.
[0017] The address, the telephone number, etc. extract the text for pinpointing a location out of the information sent by the web page of the Internet. And this extracted text is passed to the server which searches positional information (LAT, LONG) from the address or the telephone number. A server searches positional information from this address and telephone number, and returns this positional information to a terminal. If the searched positional information is returned, it will be set as a navigation system by making this positional information into the destination. Some locations, such as a tourist resort currently introduced by the web page, and restaurant information, hotel information, can be displayed on a map by this, or the path to there can be made to guide.
[0018]
[Embodiment of the Invention] Hereafter, the gestalt of implementation of this invention is explained with reference to a drawing. Drawing 1 shows the whole car-navigation system configuration to which this invention was applied. In the car-navigation system to which this invention was applied, the destination was set up and it has the navigation function to display the location of that destination on a map, or to guide the path to the destination, and the Internet connectivity function on which the Internet is accessed, it becomes a terminal and a web page is displayed. Furthermore, locations, such as tourist facilities currently introduced on the web page, and a restaurant, a hotel, are searched, this searched location is set up as a destination, it can be made to be able to display on a map or the path to the destination can be guided.
[0019] In drawing 1 , 1 is CPU (Central Processing Unit). CPU1 is controlling system-wide actuation. A bus 2 is drawn from CPU1. While a system is connected in a system (Read Only Memory) ROM 3, a program ROM 4, RAM5 for work pieces (Random Access Memory), and nonvolatile RAM 6, the GPS receiver 11, gyroscope equipment 13, the CD-ROM regenerative circuit 15, the audio decoder 27, a system controller 16, a modem 32, and a graphic controller 34 are connected to the bus 2 drawn from CPU1.
[0020] The program for the boot at the time of starting and fundamental data, such as a font, are stored in a system ROM 3. An operating system and an application program are stored in a program ROM 4. A work piece RAM is used as main memory at the time of actuation. A user's setting information etc. is stored in nonvolatile

RAM 6.

[0021] The GPS receiver 11 receives the electric wave from a satellite, and asks for the location of a current mobile. With the GPS antenna 12, the signal from the satellite for GPS is received and the reception output of this GPS antenna 12 is supplied to the GPS receiver 11. With the GPS receiver 11, the location of a current mobile is positioned based on the input signal of the GPS antenna 12. The positional information (LAT, LONG) of the mobile called for with this GPS receiver 11 is outputted to the bus 2 drawn from CPU1.

[0022] Gyroscope equipment 13 detects the acceleration of an automobile and asks for the location of a current mobile with self-contained navigation. The positional information of the mobile called for by gyroscope equipment 13 is outputted to the bus 2 drawn from CPU1.

[0023] The CD-ROM regenerative circuit 15 is an outputting-playback data of CD-ROM which offers map information etc. thing. A system controller 16 controls actuation of this CD-ROM drive.

[0024] An input is given to a system controller 16 from the remote control light-receiving circuit 17 and an input key 18. Actuation of a CD-ROM drive is set up based on this input.

[0025] An optical disk 21 is CD-ROM on which for example, map information was recorded. This optical disk 21 rotates with a spindle motor 22. Rotation of a spindle motor 22 is performed on the radical of management of a system controller 16 by the servo drive 23.

[0026] The optical pickup 24 is formed to an optical disk 21. The optical pickup 24 is made movable to radial [of a disk 21] by the slider delivery device. Moreover, the biaxial device is formed in the optical pickup 21, and the laser beam from the optical pickup 21 is made controllable biaxial [of the direction of a focus, and the direction of tracking]. A focus servo, and a tracking servo and a thread servo are performed on the radical of management of a system controller 16 by the servo drive 23.

[0027] The output of the optical pickup 24 is supplied to the CD regenerative circuit 26 through RF amplifier 25. In the CD regenerative circuit 26, EFM (8-14) recovery processing, error correction processing, etc. are performed. The output of the CD regenerative circuit 26 is supplied to the CD-ROM regenerative circuit 15. In the CD-ROM regenerative circuit 15, the map data currently recorded on the optical disk 21 are decoded. The output of this CD-ROM regenerative circuit 15 is outputted to the bus 2 drawn from CPU1.

[0028] Moreover, it can equip with CD (CD-DA) for music as an optical disk 21. When equipped with CD for music as an optical disk 21, the output of the optical pickup 24 is supplied to the CD regenerative circuit 26 through RF amplifier 25. The output of the CD regenerative circuit 26 is supplied to the audio decoder 27 through the CD-ROM regenerative circuit 15. Audio data are decoded by the audio decoder 27. This audio data is supplied to D/A converter 28, it is D/A converter 28 and digital audio data are changed into an analog audio signal. The output of D/A converter 28 is supplied to a loudspeaker 31 through a low pass filter 29 and an audio amplifier 30.

[0029] A graphic controller 34 controls a display. The output of a graphic controller 34 is supplied to the LCD drive circuit 35. The output of the LCD drive circuit 35 is supplied to a liquid crystal display 36.

[0030] A modem 32 is for accessing the Internet by using this car navigation SHISUMUTE as a terminal. A modem 32 is connected to a portable telephone 33. When accessing the Internet, a cellular phone 33 is used.

[0031] As mentioned above, in the navigation system to which this invention was applied While having the navigation function to display the location of the destination on a map or to guide the path to the destination, and the Internet connectivity function on which the Internet is accessed and a web page is displayed Locations, such as tourist facilities currently introduced on the web page, and a restaurant, a hotel, can be searched, this searched location can be set up as a destination, and navigation can be performed. This is explained below.

[0032] Drawing 2 is a functional block diagram for explaining actuation of the system by which this invention was applied. As shown in drawing 2 , in this navigation system 50, a its present location is made to display it as the connection 51 which makes connection with the Internet 60, the browser section 52 for perusing the web page of WWW of the Internet, the positioning section 53 for positioning a its present location, and the map information storage section 54 for offering map information on a map, or it has the navigation control section 55 for carrying out which performed path guidance to the destination, and the display 56. Furthermore, the extract section 57 which extracts the address, the telephone number, etc. from on a web page is formed.

[0033] Specifically, a connection 51 consists of hardware for the communication link of the modem 32 in drawing 1 , or portable telephone 33 grade, software for the protocol of the Internet to realize connection with the Internet, etc.

[0034] Specifically, the browser section 52 is the software of the browser for perusing the web page of WWW. The browser section 52 is the servers 61A, 61B, and 61C with the URL, when Servers 61A, 61B, and 61C, ..., URL (Uniform Resource Location) of 62 are specified... A web page is accessed and the multimedia screen which consists of a text, an image, etc. is formed based on the HTML language described by the web page. This

multimedia screen is displayed on a display 56.
[0035] Specifically, the positioning section 53 detects the positional information of the GPS receiver 11 and gyroscope equipment 13 grade in drawing 1 , and the present mobile.
[0036] In addition, the positioning section 53 consists of a GPS receiver 11 and gyroscope equipment 13 in this example. Although the GPS receiver 11 can perform high positioning of precision, since he uses the signal from a satellite, he cannot use it in a tunnel. On the other hand, although precision is inferior in it, since gyroscope equipment 13 is self-contained navigation, it is usable anywhere. Then, the positional information from the GPS receiver 11 and the positional information from gyroscope equipment 13 are used, choosing them suitably. Of course, it may be made to position with either a GPS receiver or gyroscope equipment.
[0037] Specifically, the map information storage section 54 consists of the optical disks 21, such as CD-ROM in drawing 1 , the servo driver 23 for driving this, a CD regenerative circuit 26, and CD-ROM regenerative-circuit 15 grade. In addition, although CD-ROM is used for accumulating map information, you may make it use DVD (Digital Versatile Disc) here.
[0038] Based on the map information from the map information storage section 54 in drawing 1 , and the its present location information from the positioning section 53, the navigation control section 55 displays a its present location on a map, or, specifically, consists of software for realizing the thing to which it showed the destination and to do.
[0039] When displaying a its present location on a map, the positional information searched for in the positioning section 53 is sent to the navigation control section 55. The map information corresponding to this present location is read from the map information storage section 54, and a superposition indication of the its present location is given into this map information.
[0040] Moreover, when carrying out path guidance, the positional information of the destination is inputted into the navigation control section 55. Based on the positional information of this destination, and the current positional information searched for in the positioning section 53, a path is computed and guidance is performed according to this path.
[0041] Specifically, a display 56 consists of the graphic controller 34 and liquid crystal display 36 in drawing 1 . In addition, although the liquid crystal display is used, you may make it use other displays, such as a CRT display, in this example.
[0042] The extract section 57 is software which extracts the character string which specifically serves as a key of locations, such as a tourist resort currently introduced by web pages, such as the address and the telephone number, and a restaurant, a hotel, from on a web page.
[0043] In the extract section 57, character strings, such as the address and the telephone number, are extracted from on a web page. This extracted character string is passed to the browser section 52. In the browser section 52, if the extracted character string is received, the server 62 which searches the location of that location will be accessed from the address or the telephone number, and this extracted character string is sent to the server 62 which searches the location of that location from the address or the telephone number.
[0044] The positional information (LAT, LONG) corresponding to that address from the character string extracted as the address or the telephone number or the telephone number is searched with the server 62 which searches the location of that location by the database from this address and telephone number. The searched positional information is returned to a terminal side.
[0045] The searched positional information is received in the browser section 52. And this positional information is set as the navigation control section 55 as a destination of **** sent to the navigation control section 55, and navigation.
[0046] In addition, a user's selection may perform the extract of a character string and it may be made to carry out automatically.
[0047] For example, what is necessary is for this character string to judge that it is the address, and just to make it extract it, if the keyword which shows the address [like a "prefecture", a "prefecture" and a "city" and a "town"] whose processing which extracts the character string of the address automatically is is contained.
[0048] Moreover, what is necessary is for the character string following this to judge that it is the telephone number, and just to make it extract it, when the processing which extracts the character string of the telephone number automatically has a keyword like a "telephone" and "TEL."
[0049] Moreover, if there is a digit string of a specific pattern as shown in "03 -" and "048 -", this judges that it is the telephone number and you may make it extract it.
[0050] Thus, a connection 51 and the browser section 52 are formed in the car-navigation system to which this invention was applied. for this reason, the servers 61A and 61B of the Internet 60 ... and 62 can be accessed 61 C and that web page can be displayed on a display 56.

[0051] In the web page of WWW, many information on tourist facilities, a restaurant, a hotel, etc. is offered. When such a web page was used and you go out for a drive at a tourist resort, the information on the tourist facilities of the land, a restaurant, a hotel, etc. can be acquired.

[0052] This web page is seen and there is a case so that he may go to the tourist facilities currently displayed on the web page, a restaurant, a hotel, etc. At this time, the character string of the addresses, such as tourist facilities currently introduced by this web page, and a restaurant, a hotel, or the telephone number is extracted from on that web page by the extract section 57.

[0053] If a character string is extracted, URL of the server 62 which searches the location of the location will be accessed from the address or the telephone number, and the extracted character string will be sent to the server 62 which searches the location of the location from the address or the telephone number from it.

[0054] If the address and the telephone number are sent, the positional information corresponding to the address and telephone number will be searched with a server 62 by the database. And this positional information is returned to the car-navigation system 50 side used as the terminal of the Internet.

[0055] If the positional information from a server 62 is received by the car-navigation system 50 side used as a terminal, this positional information will be passed to the navigation control section 55 from the browser section 52. In the navigation control section 55, this positional information is set up as a destination. And this positional information is shown on a map, or this positional information path is computed, and path guidance is performed.

[0056] Thus, the character string of the addresses, such as tourist facilities currently introduced by this web page, and a restaurant, a hotel, or the telephone number was extracted from on the web page, the location of that location was searched with this example from the character string of the address extracted by delivery and the server 62, or the telephone number to the server 62 which searches the location of the telephone number to the address or its location for this character string, and this location is set as the navigation control section 55 as a destination in it. Thereby, path guidance can be performed by making into the destination the location of the tourist facilities currently introduced by the web page, a restaurant, a hotel, etc., etc.

[0057] That is, the browser section is started, and as shown in drawing 3 A, suppose that the homepage of a restaurant is displayed on a web page 101. On this page, the character string 102 of the address and the character string 103 of the telephone number are contained.

[0058] As shown in drawing 3 B, the character strings 102 and 103 of the address or the telephone number are extracted from on this web page. And it is sent to the server 62 which searches the location of that location from the address and the telephone number which have the character strings 102 and 103 of this extracted address or the telephone number on the Internet.

[0059] As shown in drawing 4 A, the character strings 102 and 103 of this extracted address and telephone number are received from the address or the telephone number by the server 62 which searches the location of that location. And as shown in drawing 4 B, the positional information (LAT, LONG information) 106 of that location is searched by the database 105 from the character strings 102 and 103 of this extracted address and telephone number. As shown in drawing 4 C, it is returned to the car-navigation system with which this searched positional information 106 has become the terminal side.

[0060] As shown in drawing 5 A, it is received in the browser section 52 of the car-navigation system with which this searched positional information 106 has become the terminal side. If positional information is received in the browser section 52, this positional information will be passed to the navigation control section 55. And as shown in drawing 5 B, the destination is set up by this positional information.

[0061] According to the set-up destination, path planning count is performed, and as shown in drawing 5 C, path guidance is displayed.

[0062] Drawing 6 is a flow chart which shows the processing at this time. In drawing 6 , by the browser side, when the web page is displayed, it is judged whether the character string of the address or the telephone number is contained on (step S1) and its web page (step S2). If the character string of the address or the telephone number is contained, that example of an alphabetic character will be extracted (step S3), and it will be transmitted to the server with which this character string searches a location from the address or the telephone number (step S4).

[0063] This example of an alphabetic character is received in a server (step S5). And a database is searched by this character string (step S6), and the positional information (LAT, LONG) corresponding to the character string of the address extracted from the web page or the telephone number is computed (step S7). This positional information is transmitted towards a terminal (step S8).

[0064] In a browser side, if this positional information (LAT, LONG) is received (step S9), this positional information will be handed over by the navigation control section (step S10).

[0065] In a NABIGESHOTSU control section, the destination is set up based on this positional information (step S11). And path planning is calculated according to the set-up destination (step S12), and path guidance is performed based on this path for which it was searched (step S13).

[0066] In addition, in the above-mentioned example, as a character string for searching positional information, although the address and the telephone number are used, neither the address nor the telephone number is always carried into the web page. In this case, the location of an outline can be searched if the name of a place which has appeared most frequently in that page, for example is set up as a destination. Moreover, you may make it use a zip code.

[0067] Moreover, although the server 62 which searches the location of that location is placed on the Internet from the address or the telephone number in this example, it provides using CD-ROM or DVD and you may make it search the location of the address or the telephone number to that location for example, with the database 71 side with a terminal for the database 71 with which the location of that location is searched from the address or the telephone number, as shown in drawing 7 . In this case, what is necessary is just to make it access storage devices, such as local CD-ROM and DVD, as URL instead of accessing URL of the server which searches the location of that location from the address or the telephone number by the browser.

[0068]

[Effect of the Invention] According to this invention, the address, the telephone number, etc. extract the text for pinpointing a location out of the information sent by the web page of the Internet. And this extracted text is passed to the server which searches positional information (LAT, LONG) from the address or the telephone number. A server searches positional information from this address and telephone number, and returns this positional information to a terminal. If the searched positional information is returned, it will be set as a navigation system by making this positional information into the destination. Some locations, such as a tourist resort currently introduced by the web page, and restaurant information, hotel information, can be displayed on a map by this, or the path to there can be made to guide.

[Translation done.]